CAMBRIA

3749/RO 484

APR 16 2002

March 25, 2002

Mr. Barney Chan
Alameda County Department of Environmental Health
UST Local Oversight Program
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

APR 02 2002

Re: **First Quarter 2002 Monitoring Report**
Former ARCO Service Station (Bo Gin)
706 Harrison Street
Oakland, California
STID 3749
Cambria Project #230-0116

Dear Mr. Chan:

On behalf of Mr. Bo K. Gin, Cambria Environmental Technology, Inc. (Cambria) is submitting this first quarter 2002 groundwater monitoring report for the above-referenced site. Presented in the report are the first quarter 2002 activities and results and the anticipated second quarter 2002 activities.

If you have any questions or comments regarding this report, please call me at (510) 450-1983.

Sincerely,
Cambria Environmental Technology, Inc.

Ron Scheele, RG
Senior Geologist

Attachments: First Quarter 2002 Monitoring Report

cc: Mr. Bo K. Gin, 288 11th Street, Oakland, California 94706

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

CAMBRIA

FIRST QUARTER 2002 MONITORING REPORT

Former ARCO Service Station (Bo Gin)
706 Harrison Street
Oakland, California
STID 3749
Cambria Project #230-0116

APR 02 2002

March 25, 2002

Prepared for:

Mr. Bo K. Gin
288 11th Street
Oakland, California 94706

Prepared by:

Cambria Environmental Technology, Inc.
6262 Hollis Street
Emeryville, California 94102

REGISTERED GEOLOGIST • RONALD A. SCHEELE • No. 6842 • STATE OF CALIFORNIA

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

Matthew A. Meyers
Staff Geologist

Ron Scheele, RG
Senior Geologist

CAMBRIA

FIRST QUARTER 2002 MONITORING REPORT

Former ARCO Service Station (Bo Gin)
706 Harrison Street
Oakland, California
STID 3749
Cambria Project #230-0116

March 15, 2002

INTRODUCTION

On behalf of Mr. Bo K. Gin, Cambria Environmental Technology, Inc. (Cambria) is submitting this first quarter 2002 groundwater monitoring report for the above-referenced site. Presented below are the first quarter 2002 activities and results and the anticipated second quarter 2002 activities.

FIRST QUARTER 2002 ACTIVITIES

Monitoring Activities

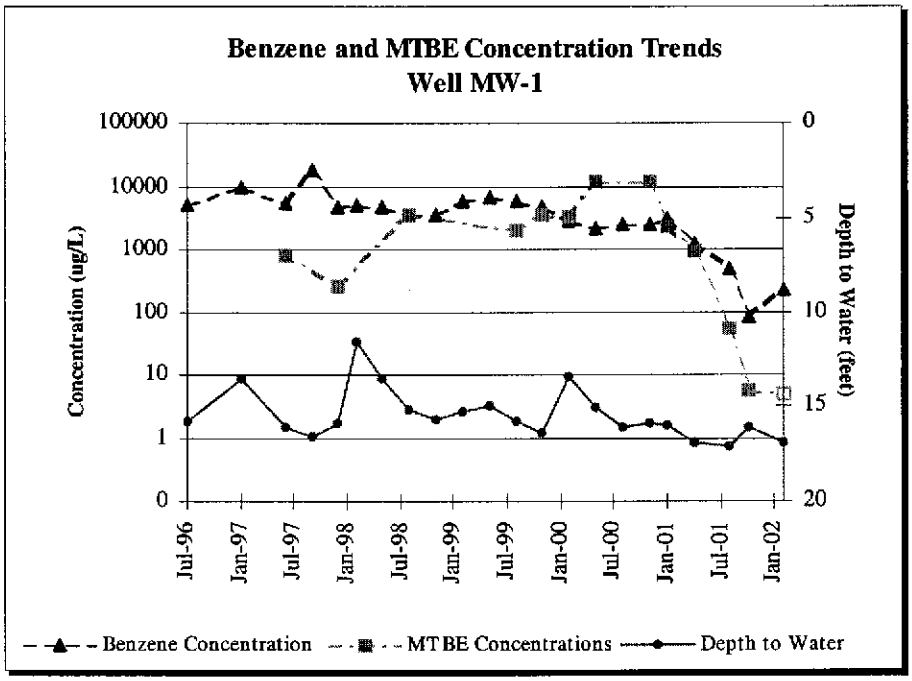
Field Activities: On February 1, 2002, Cambria conducted quarterly monitoring and sampling activities. Cambria gauged groundwater levels in monitoring wells MW-1 through MW-7 (see Figure 1). Groundwater samples were collected from all wells according to the sampling schedule. Field Data Sheets are presented as Appendix A.

Sample Analyses: Groundwater samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg) by modified EPA Method 8015, and benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl tertiary butyl ether (MTBE) by EPA Method 8020. Samples containing MTBE were further analyzed for MTBE using EPA Method 8260. Laboratory analytical results are included as Appendix B. Groundwater elevations are shown on Figure 1.

Monitoring Results

Groundwater Flow Direction: The groundwater flow direction on February 2, 2002 was split with groundwater flowing towards the north along the northern portion of the site, and groundwater flowing towards the south along the southern portion of the site. This split gradient has been apparent during the last four monitoring quarters. Based on depth-to-water measurements collected during Cambria's February 1, 2002 site visit, groundwater in the southern portion of the site flows toward the south southeast at a rate of 0.013 ft/ft (Figure 1).

Hydrocarbon Distribution in Groundwater: Hydrocarbon concentrations were detected in four of the seven wells analyzed and were generally less than the previous quarter. Benzene concentrations decreased significantly in wells MW-2 and MW-4 as compared with the previous quarter. The maximum TPHg concentration was detected in well MW-4 at 2,600 micrograms per liter (µg/L). The maximum benzene concentration was detected in well MW-1 at 220 µg/L. No MTBE was detected in any of the wells. Decreasing benzene and MtBE concentration trends can be seen in monitoring wells MW-1, MW-2, and MW-4 (see graph below and Appendix C).



Corrective Action Activities

Cambria operated the air sparging system throughout the first quarter to enhance the natural attentuation of the remaining hydrocarbons. Air was injected into air sparge wells SP-3, SP-4, and SP-5 at a rate of approximately 3 to 4 cfms and at pressures ranging from 5 to 10.5 psi.

ANTICIPATED SECOND QUARTER 2002 ACTIVITIES

Monitoring Activities

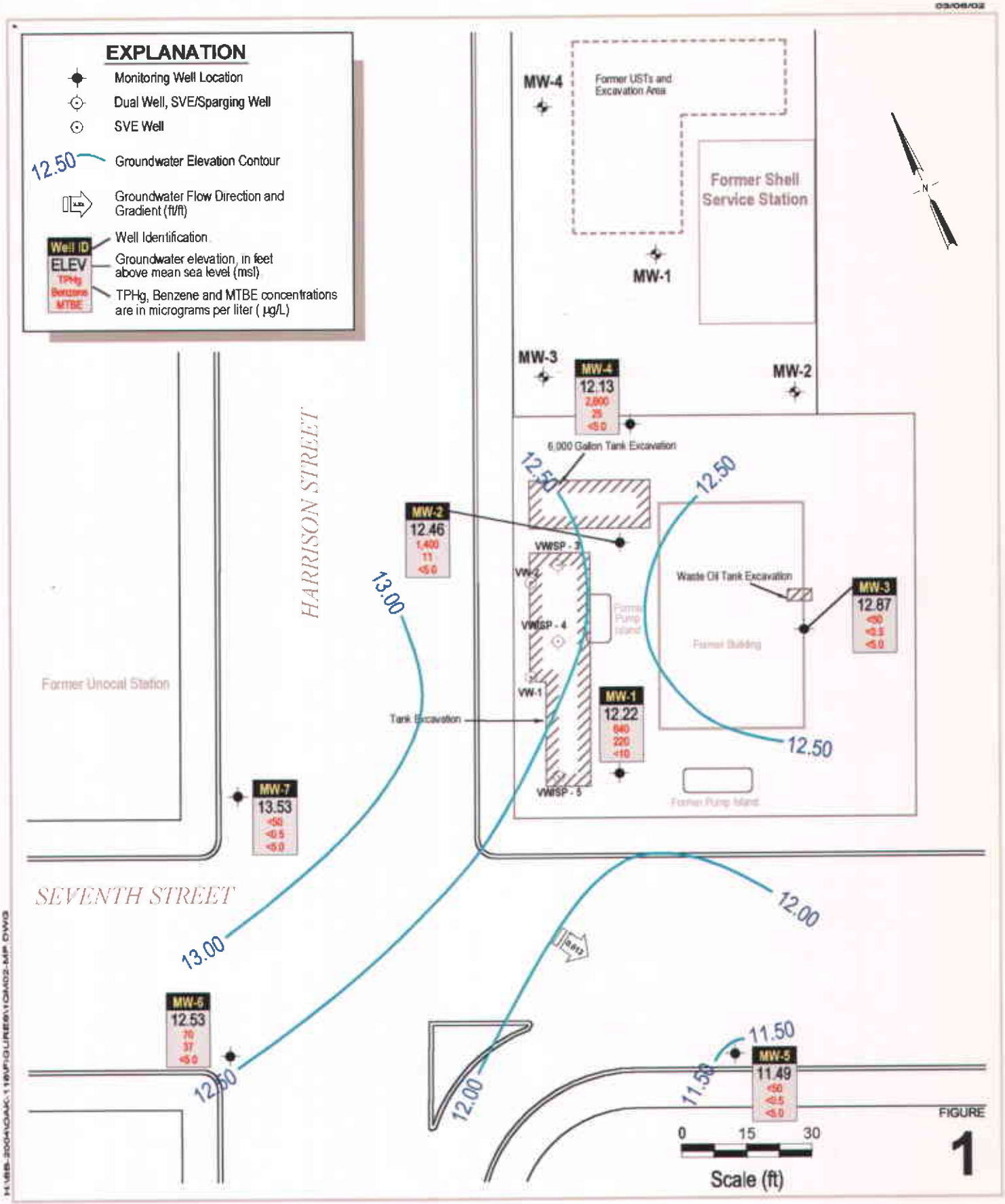
Cambria will gauge all wells, check the wells for SPH, and collect groundwater samples from scheduled wells that do not contain SPH. Groundwater samples will be analyzed for TPHg by Modified EPA Method 8015 and BTEX and MTBE by EPA Method 8020. Any samples containing MTBE will be confirmed by EPA Method 8260. Cambria will prepare a groundwater monitoring report summarizing the monitoring activities and results.

Corrective Action Activities

Cambria plans to continue operation of the air sparging system during the second quarter 2002 while remediation testing is performed at the upgradient service station site.

APPENDICES

Figure 1 – Groundwater Elevation Contour Map
Table 1 – Groundwater Elevations and Analytical Data
Appendix A – Groundwater Monitoring Field Data Sheets
Appendix B – Laboratory Analytical Report
Appendix C – Benzene and MtBE Concentration Graphs – MW-1, MW-2, and MW-4



Former ARCO Station

706 Harrison Street

Oakland, California

CAMBRIA

Groundwater Elevation Contour Map

February 1, 2002

CAMBRIA

Table 1. Groundwater Elevations and Analytical Data - Former ARCO Station - 706 Harrison Street, Oakland, California

Well ID TOC Elevation Monitoring Frequency	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft-msl)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (8020) (µg/L)	MTBE (8260) (µg/L)	Notes
MW-1	8/13/93	17.40	11.75	20,000	8,500	640	280	440	-	-	
29.15	12/14/93	17.27	11.88	17,000	9,200	1,200	4,400	540	-	-	
Quarterly	4/15/94	17.00	12.15	9,500	3,600	530	160	280	-	-	
	12/29/94	16.40	12.75	-	-	-	-	-	-	-	
	7/19/96	15.83	13.32	17,000	5,200	1,100	330	530	-	-	sheen/odor
	1/27/97	13.58	15.57	30,000	9,800	1,300	790	880	400	-	b, sheen/odor
	6/18/97	16.11	13.04	19,000	5,600	1,400	510	770	1,200	800	a, b
	9/18/97	16.62	12.53	48,000	18,000	4,400	1,000	1,700	<640	-	b
	12/10/97	15.93	13.22	22,000	4,900	1,300	580	650	460	260	a, b, odor
	2/18/98	11.56	17.59	16,000	5,000	750	400	780	1,800	-	b
	5/12/98	13.53	15.62	19,000	4,600	810	450	770	5,500	-	b, c
	8/18/98	15.19	13.96	12,000	3,600	1,300	300	570	5,100	3,700	a, b
	11/24/98	15.67	13.48	13,000	3,600	890	330	380	6,100	-	b
	2/4/99	15.31	13.84	20,000	5,900	830	450	500	4,900	-	b
	5/18/99	14.95	14.20	23,000	7,000	1,600	520	830	6,100	-	b
	8/27/99	15.84	13.31	19,000	5,800	1,700	410	710	1,800	2,100	a, b
	11/18/99	16.39	12.76	20,000	4,900	630	410	580	4,900	3,600	b
	2/29/00	13.43	15.72	12,000	2,800	24	290	170	3,100	3,400	a
	5/25/00	15.08	14.07	12,000	2,200	120	330	260	9,100	12,000	a, b
	8/9/00	16.09	13.06	13,000	2,500	44	310	140	16,000	-	b
	11/9/00	15.90	13.25	11,000	2,500	140	380	150	11,000	12,000	b
	1/29/01	16.05	13.10	9,600	3,100	100	77	200	2,600	2,400	b
	4/16/01	16.90	12.25	3,300	1,200	4.4	2.7	28	900	940	b
	8/14/01	17.13	12.02	2,000	500	3.4	24	7.8	68	53	a
	10/22/01	16.11	13.04	220	83	0.63	2.8	<0.5	<10	5.7	a
	2/1/02	**16.93**	**12.22**	**640**	**220**	**1.7**	**4.7**	**0.57**	**<10**	-	**a**

Table 1. Groundwater Elevations and Analytical Data - Former ARCO Station - 706 Harrison Street, Oakland, California

Well ID TOC Elevation Monitoring Frequency	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft-msl)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (8020) (µg/L)	MTBE (8260) (µg/L)	Notes
MW-2	8/13/93	17.05	13.46	34,000	6,800	10,000	740	3,900	-	-	
30.51	12/14/93	18.28	12.23	16,000	3,200	4,200	500	1,700	-	-	
Quarterly	4/15/94	18.10	12.41	23,000	2,500	4,200	470	1,800	-	-	
	12/29/94	17.40	13.11	-	-	-	-	-	-	-	
	7/19/96	16.72	13.79	90,000	7,300	14,000	1,600	7,300	-	-	odor
	1/27/97	14.89	15.62	63,000	7,100	13,000	1,600	7,100	500	-	b, odor
	6/18/97	17.12	13.39	52,000	5,100	10,000	1,400	6,000	<200	-	b
	9/18/97	17.63	12.88	110,000	9,400	23,000	2,600	13,000	<890	-	b, sheen/odor
	12/10/97	16.98	13.53	39,000	2,600	5,300	940	3,900	780	320	b, odor
	2/18/98	12.61	17.90	85,000	9,000	19,000	2,300	11,000	2,400	-	b
	5/12/98	14.45	16.06	110,000	9,500	21,000	2,500	12,000	<1,200	-	b
	8/18/98	16.14	14.37	64,000	6,000	13,000	1,700	7,800	2,000	1,300	a, b
	11/24/98	16.70	13.81	78,000	5,300	14,000	2,300	11,000	<2,000	-	b, g
	2/4/99	18.39	12.12	66,000	5,800	16,000	2,600	12,000	3,000	-	b, g
	5/18/99	15.90	14.61	78,000	6,700	17,000	2,400	10,000	4,300	-	b
	8/27/99	16.79	13.72	91,000	7,400	17,000	2,300	11,000	1,200	1,000	a, b
	11/18/99	17.32	13.19	180,000	7,000	20,000	3,300	16,000	<6,000	1,700	b,g
	2/29/00	14.37	16.14	86,000	5,500	13,000	2,000	9,500	3,500	4,700	a
	5/25/00	16.01	14.50	110,000	6,300	14,000	2,400	10,000	7,500	6,500	a, b, g
	8/9/00	17.02	13.49	77,000	5,000	13,000	2,000	8,600	5,900	-	b
	11/9/00	17.00	13.51	70,000	4,800	12,000	1,900	8,000	9,400	8,300	b
	1/29/01	18.31	12.20	110,000	8,200	21,000	2,800	13,000	2,500	1,900	b,g
	4/16/01	18.59	11.92	97,000	7,400	15,000	2,500	12,000	<3,000	<50	b,g
	8/14/01	18.74	11.77	97,000	6,200	14,000	2,400	13,000	<250	<50	a,j
	10/22/01	18.27	12.24	71,000	5,900	15,000	2,400	12,000	<1,400	150	a
	2/1/02	**18.05**	**12.46**	**1,400**	**11**	**88**	**44**	**210**	**<5.0**	**-**	**a**

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Table 1. Groundwater Elevations and Analytical Data - Former ARCO Station - 706 Harrison Street, Oakland, California

Well ID TOC Elevation Monitoring Frequency	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft-msl)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (8020) (µg/L)	MTBE (8260) (µg/L)	Notes
MW-3	8/13/93	17.05	12.72	<50	<0.50	<0.50	<0.50	<1.5	-	-	
29.77	12/14/93	17.70	12.07	<50	<0.50	<0.50	<0.50	<1.5	-	-	
Bi-annually	4/15/94	17.40	12.37	<50	<0.5	<0.5	<0.5	<0.5	-	-	
	12/29/94	16.80	12.97	-	-	-	-	-	-	-	
	7/19/96	16.28	13.49	<50	<0.5	<0.5	<0.5	<0.5	-	-	
	1/27/97	13.83	15.94	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	6/18/97	16.53	13.24	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	9/18/97	17.07	12.70	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	12/10/97	16.15	13.62	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	2/18/98	11.80	17.97	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	5/12/98	13.85	15.92	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	8/18/98	15.57	14.20	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	11/24/98	16.04	13.73	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	2/4/99	17.80	11.97	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	5/18/99	15.29	14.48	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	8/27/99	16.15	13.62	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	11/18/99	16.77	13.00	-	-	-	-	-	-	-	
	2/29/00	13.71	16.06	<50	2	<0.5	<0.5	<0.5	<5.0	-	
	5/25/00	15.46	14.31	-	-	-	-	-	-	-	
	8/9/00	16.46	13.31	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	11/9/00	16.25	13.52	-	-	-	-	-	-	-	
	1/29/01	16.52	13.25	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	4/16/01	16.95	12.82	-	-	-	-	-	-	-	
	8/14/01	17.11	12.66	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	10/22/01	16.50	13.27	-	-	-	-	-	-	-	
	2/1/02	**16.90**	**12.87**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5.0**	**-**	

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Well ID TOC Elevation Monitoring Frequency	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft-msl)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (8020) (µg/L)	MTBE (8260) (µg/L)	Notes
MW-4	12/16/94	18.10	13.08	2,500	32	6.5	4.5	17	-	-	
31.18	12/29/94	17.95	13.23	-	-	-	-	-	-	-	
Quarterly	7/19/96	17.38	13.80	3,300	520	39	67	60	-	-	
	1/27/97	15.25	15.93	4,500	860	55	100	91	1,100	-	b
	6/18/97	17.61	13.57	2,700	700	52	81	76	2,200	2,300	a, b
	9/18/97	18.01	13.17	3,900	760	38	56	64	<170	-	b
	12/10/97	17.45	13.73	12,000	1,800	120	210	210	2,900	2,600	a, b
	2/18/98	13.09	18.09	1,700	210	8	6.7	16	200	-	b
	5/12/98	14.78	16.40	2,100	300	15	36	34	920	-	b, c
	8/18/98	16.59	14.59	4,700	1,000	130	110	150	5,200	4,900	a, b
	11/24/98	17.18	14.00	3,000	810	44	76	94	4,800	-	b
	2/4/99	18.90	12.28	2,800	770	50	69	69	3,100	-	b
	5/18/99	16.30	14.88	4,000	780	57	7.7	79	4,800	-	b
	8/27/99	17.21	13.97	4,100	870	51	74	99	3,300	4,100	a, b
	11/18/99	17.77	13.41	3,000	760	43	67	65	5,100	5,400	b
	2/29/00	14.85	16.33	4,600	1,000	64	94	170	4,100	4,600	a
	5/25/00	16.45	14.73	2,600	540	39	59	41	3,500	5,300	b
	8/9/00	17.47	13.71	4,400	930	66	98	79	9,400	-	b
	11/9/00	17.45	13.73	4,200	630	34	54	44	7,800	9,400	b
	1/29/01	18.90	12.28	3,100	710	34	66	51	9,400	8,000	b
	4/16/01	19.17	12.01	160	1.2	1.3	<0.5	12	22	20	b
	8/14/01	19.20	11.98	1,700	190	11	35	13	300	250	b
	10/22/01	18.95	12.23	1,100	120	3.7	29	7.9	<25	16	a
	2/1/02	**19.05**	**12.13**	**2,600**	**25**	**43**	**21**	**280**	**<5.0**	-	**a**

Table 1. Groundwater Elevations and Analytical Data - Former ARCO Station - 706 Harrison Street, Oakland, California

Well ID TOC Elevation Monitoring Frequency	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft-msl)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (8020) (µg/L)	MTBE (8260) (µg/L)	Notes
MW-5	12/16/94	16.07	11.97	<50	1.1	<0.5	<0.5	2.4	-	-	
28.04	12/29/94	16.10	11.94	-	-	-	-	-	-	-	
Bi-annually	7/19/96	15.49	12.55	<50	<0.5	<0.5	<0.5	<0.5	-	-	
	1/27/97	13.60	14.44	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	6/18/97	15.55	12.49	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	9/18/97	16.16	11.88	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	12/10/97	15.41	12.63	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	2/18/98	10.93	17.11	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	5/12/98	13.25	14.79	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	8/18/98	14.75	13.29	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	11/24/98	15.15	12.89	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	2/4/99	14.61	13.43	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	5/18/99	14.15	13.89	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	8/27/99	15.43	12.61	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	11/18/99	15.97	12.07	-	-	-	-	-	-	-	
	2/29/00	13.16	14.88	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	5/25/00	14.72	13.32	-	-	-	-	-	-	-	--
	8/9/00	15.68	12.36	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	11/9/00	15.39	12.65	-	-	-	-	-	-	-	
	1/29/01	15.97	12.07	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	4/16/01	16.24	11.80	-	-	-	-	-	-	-	
	8/14/01	17.39	10.65	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	10/22/01	15.90	12.14	-	-	-	-	-	-	-	
	2/1/02	**16.55**	**11.49**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5.0**	**-**	

Table 1. Groundwater Elevations and Analytical Data - Former ARCO Station - 706 Harrison Street, Oakland, California

Well ID TOC Elevation Monitoring Frequency	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft-msl)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (8020) (µg/L)	MTBE (8260) (µg/L)	Notes
MW-6	12/16/94	17.74	11.36	-	-	-	-	-	-	-	
29.1	12/29/94	17.40	11.70	-	-	-	-	-	-	-	
Bi-annually	7/19/96	16.60	12.50	<50	<0.5	<0.5	<0.5	<0.5	-	-	
	1/27/97	14.88	14.22	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	6/18/97	16.73	12.37	51	22	<0.5	<0.5	<0.5	<5.0	-	c
	9/18/97	17.24	11.86	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	12/10/97	16.56	12.54	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	2/18/98	12.93	16.17	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	5/12/98	14.35	14.75	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	8/18/98	15.94	13.16	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	11/24/98	16.46	12.64	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	2/4/99	18.25	10.85	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	5/18/99	15.73	13.37	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	8/27/99	15.64	13.46	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	11/18/99	17.04	12.06	-	-	-	-	-	-	-	
	2/29/00	14.55	14.55	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	5/25/00	15.86	13.24	-	-	-	-	-	-	-	
	8/9/00	16.80	12.30	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	11/9/00	16.60	12.50	-	-	-	-	-	-	-	
	1/29/01	17.00	12.10	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	4/16/01	17.15	11.95	-	-	-	-	-	-	-	
	8/14/01	17.30	11.80	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	10/22/01	17.13	11.97	-	-	-	-	-	-	-	
	2/1/02	**16.57**	**12.53**	**70**	**37**	**<0.5**	**<0.5**	**<0.5**	**<5.0**	-	**a**

Table 1. Groundwater Elevations and Analytical Data - Former ARCO Station - 706 Harrison Street, Oakland, California

Well ID TOC Elevation Monitoring Frequency	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft-msl)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (8020) (µg/L)	MTBE (8260) (µg/L)	Notes
MW-7	12/16/94	17.07	12.60	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
29.67	12/29/94	17.65	12.02	-	-	-	-	-	-	-	
Bi-annually	7/19/96	16.44	13.23	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	1/27/97	15.09	14.58	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	6/18/97	16.59	13.08	73	<0.5	0.55	<0.5	<0.5	<5.0	-	d
	9/18/97	17.06	12.61	94	<0.5	<0.5	<0.5	<0.5	<5.0	-	e, f
	12/10/97	16.58	13.09	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	2/18/98	12.60	17.07	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	5/12/98	14.81	14.86	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	8/18/98	15.67	14.00	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	11/24/98	16.30	13.37	200	<0.5	<0.5	<0.5	<0.5	<5.0	-	d
	2/4/99	15.99	13.68	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	5/18/99	15.42	14.25	200	<0.5	<0.5	<0.5	<0.5	<5.0	-	d
	8/27/99	16.35	13.32	140	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	11/18/99	16.81	12.86	--	--	--	--	--	--	-	
	2/29/00	14.16	15.51	100	<0.5	<0.5	<0.5	<0.5	<5.0	-	f
	5/25/00	15.54	14.13	--	--	--	--	--	--	-	
	8/9/00	16.56	13.11	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	11/9/00	16.45	13.22	-	-	-	-	-	-	-	
	1/29/01	16.92	12.75	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	4/16/01	17.03	12.64	-	-	-	-	-	-	-	
	8/14/01	17.27	12.40	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	
	10/22/01	16.95	12.72	-	-	-	-	-	-	-	
	2/1/02	**16.14**	**13.53**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5.0**	**-**	
Trip Blank	11/9/00	-	-	<50	<0.5	<0.5	<0.5	<0.5	<5.0	-	

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Table 1. Groundwater Elevations and Analytical Data - Former ARCO Station - 706 Harrison Street, Oakland, California

Well ID TOC Elevation Monitoring Frequency	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft-msl)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (8020) (µg/L)	MTBE (8260) (µg/L)	Notes

Abbreviations and Analyses:

TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015
Benzene, ethylbenzene, toluene and xylenes by EPA Method 8020.
MTBE = Methyl tertiary butyl ether by EPA Method 8020 and/or 8260.
µg/L = Micrograms per liter
TOC = Top of casing elevation with respect to mean sea level
- = not sampled

Notes

a = Analytical laboratory notes that unmodified or weakly modified gasoline is significant.
b = Analytical laboratory notes that heavier gasoline range compounds are significant.
c = Analytical laboratory notes that lighter gasoline range compounds are significant.
d = Analytical laboratory notes that isolated peaks are present.
e = Analytical laboratory notes that heavier gasoline range compounds are significant.
f = Analytical laboratory notes hydrocarbons with no recognizable patterns are present.
g = Analytical laboratory notes lighter than water immiscible sheen is present.
j = Sample diluted due to high organic content.
Data prior to 12/16/94 provided by previous consultant.

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ATTACHMENT A

Groundwater Monitoring Field Data Sheets

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WELL DEPTH MEASUREMENTS

Well ID	Time	Product Depth	Water Depth	Product Thickness	Well Depth	Comments
MW-1	7:44		16.93		24.20	
MW-2	7:46		18.05		25.50	
MW-3	7:40		16.90		27.55	
MW-4	7:42		19.05		25.40	
MW-5	7:35		16.55		27.80	
MW-6	7:33		16.57		25.85	
MW-7	7:30		16.14		27.50	

Project Name: Bo Gin

Project Number: 230-0116

Measured By: J. Mtl

Date: 2-1-02

F:\TEMPLATE\FORMS\FIELD\GW-DEPTH.WPD

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WELL SAMPLING FORM

Project Name: BoGin	Cambria Mgr: RAS	Well ID: MW-1
Project Number: 230-0116	Date: 2-1-02	Well Yield: ----
Site Address: 706 Harrison St Oakland, Ca	Sampling Method: Disposable bailer	Well Diameter: 2" pvc
		Technician(s): SG
Initial Depth to Water: 16.93	Total Well Depth: 24.20	Water Column Height: 7.27
Volume/ft: 0.16	1 Casing Volume: 1.16	3 Casing Volumes: 3.48
Purging Device: disposable bailer	Did Well Dewater?: no	Total Gallons Purged: 3.5
Start Purge Time: 9:30	Stop Purge Time: 9:35	Total Time: 5 mins

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C	pH	Cond. uS	Comments
9:32	1 1	16.4	7.19	1320	
9:34	2 2	16.7	7.08	1501	
9:36	3 3.5	16.5	7.05	1517	
					[illegible]

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-1	2-1-02	9:40	voa	HCl	TPHg BTEX MTBE	8015/8020
MW-						

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WELL SAMPLING FORM

Project Name: Hooshi's	Cambria Mgr: RAS	Well ID: MW- 2
Project Number: 129-0741	Date: 2-1-02	Well Yield: ----
Site Address: 1499 MacArthur Blvd Oakland, Ca	Sampling Method: Disposable bailer	Well Diameter: 2" pvc
		Technician(s): SG
Initial Depth to Water: 18.05	Total Well Depth: 25.50	Water Column Height: 7.45
Volume/ft: 0.16	1 Casing Volume: 1.19	3 Casing Volumes: 3.57
Purging Device: disposable bailer	Did Well Dewater?: no	Total Gallons Purged: 3.57
Start Purge Time: 9:50	Stop Purge Time: 9:55	Total Time: 5mins

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C	pH	Cond. uS	Comments
9:52	1 1.5	16.9	7.15	1520	
9:54	2 2.5	16.7	7.00	1874	
9:56	3 3.5	16.5	7.20	1859	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW- 2	2-1-02	10:00	VOa	HCl	TPHg BTEX MTBE	8020/8015
MW-						

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WELL SAMPLING FORM

Project Name: BoGin	Cambria Mgr: RAS	Well ID: MW-3
Project Number: 230-0116	Date: 2-1-02	Well Yield: -----
Site Address: 706 Harrison St Oakland, Ca	Sampling Method: Disposable bailer	Well Diameter: 2" pvc
		Technician(s): SG
Initial Depth to Water: 16.90	Total Well Depth: 27.55	Water Column Height: 10.65
Volume/ft: 0.16	1 Casing Volume: 1.70	3 Casing Volumes: 5.11
Purging Device: disposable bailer	Did Well Dewater?: no	Total Gallons Purged: 5
Start Purge Time: 9:10	Stop Purge Time: 9:15	Total Time: 5mins

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C	pH	Cond. uS	Comments
9:12	1 1.5	16.9	7.11	820	
9:14	2 2.5	16.4	7.08	857	
9:16	3 5.0	16.7	7.15	892	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-3	2-1-02	9:20	voa	HCl	TPHg BTEX MTBE	8015/8020
MW-						

TEMPLATE\FORMS\FIELD\WELLSAMP.WPD
M 2/11/94

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WELL SAMPLING FORM

Project Name: Bosin	Cambria Mgr: RAS	Well ID: MW-4
Project Number: 230-0916	Date: 2-1-02	Well Yield: -----
Site Address: 706 Harrison St Oakland, Ca	Sampling Method: Disposable bailer	Well Diameter: 2" pvc
		Technician(s): SG
Initial Depth to Water: 19.05	Total Well Depth: 25.40	Water Column Height: 6.35
Volume/ft: 0.16	1 Casing Volume: 1.01	3 Casing Volumes: 3.03
Purging Device: disposable bailer	Did Well Dewater?: no	Total Gallons Purged: 3
Start Purge Time: 8:50	Stop Purge Time: 8:55	Total Time: 5 mins

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C	pH	Cond. uS	Comments
8:52	1	16.5	7.13	720	
8:54	2	16.5	7.09	784	
8:56	3	16.7	7.05	718	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-4	2-1-02	9:00	VOA	HCl	TPH$_g$ BTEX MTBE	8020/8015
MW-						

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WELL SAMPLING FORM

Project Name: BoGin	Cambria Mgr: RAS	Well ID: MW- 5
Project Number: 230-0116	Date: 2-1-02	Well Yield: -----
Site Address: 706 Harrison St Oakland, Ca	Sampling Method: Disposable bailer	Well Diameter: 2" pvc
		Technician(s): SG
Initial Depth to Water: 16.55	Total Well Depth: 27.80	Water Column Height: 11.25
Volume/ft: 0.16	1 Casing Volume: 1.80	3 Casing Volumes: 5.40
Purging Device: disposable bailer	Did Well Dewater?: no	Total Gallons Purged: 5
Start Purge Time: 8:30	Stop Purge Time: 8:35	Total Time: 5mins

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C	pH	Cond. uS	Comments
8:32	1	1.5	16.9	7.03	850	
8:34	2	3	16.8	~~7.10~~ 7.10	971	
8:36	3	5	16.5	7.17	1003	
					DO 2

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-5	2-1-02	8:40	VOA	HCl	TPHg BTEX MTBE	8015 / 8020
MW-						

TEMPLATE/FORMS/FIELDSHEET.SAMP.WPD

CAMBRIA

WELL SAMPLING FORM

Project Name: BoGin	Cambria Mgr: RAS	Well ID: MW-6
Project Number: 230-0116	Date: 2-1-02	Well Yield: -----
Site Address: 706 Harrison St Oakland, Ca	Sampling Method: Disposable bailer	Well Diameter: 2" pvc
		Technician(s): SG
Initial Depth to Water: 16.57	Total Well Depth: 28.85	Water Column Height: 12.28
Volume/ft: 0.16	1 Casing Volume: 1.96	3 Casing Volumes: 5.89
Purging Device: disposable bailer	Did Well Dewater?: no	Total Gallons Purged: 6
Start Purge Time: 8:10	Stop Purge Time: 8:05	Total Time: 5 mins

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C	pH	Cond. uS	Comments
8:12	1 2	16.5	7.15	1024	
8:14	2 4	16.8	7.09	985	
8:16	3 6	16.7	7.11	997	
					Odor

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-6	2-1-02	8:20	voa	HCl	TPHg BTEX MTBE.	8015 / 8020
MW-						

CAMBRIA

WELL SAMPLING FORM

Project Name: Hooshi's	Cambria Mgr: RAS	Well ID: MW- 7
Project Number: 129-0741	Date: 2-1-02 (previous date struck through)	Well Yield: ----
Site Address: 1499 MacArthur Blvd Oakland, Ca	Sampling Method: Disposable bailer	Well Diameter: 2" pvc
		Technician(s): SG
Initial Depth to Water: 16.14	Total Well Depth: 27.50	Water Column Height: 11.36 (last digits overwritten)
Volume/ft: 0.16	1 Casing Volume: 1.81	3 Casing Volumes: 5.45
Purging Device: disposable bailer	Did Well Dewater?: no	Total Gallons Purged: 5
Start Purge Time: 7:55	Stop Purge Time: 8:00	Total Time: 5 mins

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C	pH	Cond. uS	Comments
7:57	1 1.5	16.5	7.11	1315	
7:59	2 3	16.3	7.05	820	
8:01	3 5	16.9	7.02	759	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW- 7	2-1-02 (previous date struck through)	8:05	VOa	HCl	TPHg BTEX MTBE	8020/8015
MW-						

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ATTACHMENT B

Laboratory Analytical Report

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

Cambria Environmental Technology 6262 Hollis Street Emeryville, CA 94608	Client Project ID: #230-0116-124; Bogin	Date Sampled: 02/01/02
		Date Received: 02/06/02
	Client Contact: Ron Scheele	Date Extracted: 02/06/02
	Client P.O:	Date Analyzed: 02/06/02

02/13/02

Dear Ron:

Enclosed are:

1). the results of **7** samples from your **#230-0116-124; Bogin** project,

2). a QC report for the above samples

3). a copy of the chain of custody, and

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

Cambria Environmental Technology	Client Project ID: #230-0116-124; Bogin	Date Sampled: 02/01/02
6262 Hollis Street		Date Received: 02/06/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Extracted: 02/07-02/08/02
	Client P.O:	Date Analyzed: 02/07-02/08/02

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)+	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes	% Recovery Surrogate
89687	MW-1	W	640,a	ND<10	220	1.7	4.7	0.57	---#
89688	MW-2	W	1400,a	ND	11	88	44	210	115
89689	MW-3	W	ND	ND	ND	ND	ND	ND	106
89690	MW-4	W	2600,a	ND	25	43	21	280	---#
89691	MW-5	W	ND	ND	ND	ND	ND	ND	106
89692	MW-6	W	70,a	ND	37	ND	ND	ND	106
89693	MW-7	W	ND	ND	ND	ND	ND	ND	106
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	5.0	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

cluttered chromatogram; sample peak coelutes with surrogate peak

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 2nd Ave. South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

QC REPORT

EPA 8015m + 8020

Date: 02/07/02 **Extraction:** EPA 5030 **Matrix:** Water

Compound	Concentration: ug/L				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 20202					Instrument:		GC-3
Surrogate1	ND	100.0	101.0	100.00	100	101	1.0
Xylenes	ND	35.7	33.7	30.00	119	112	5.8
Ethylbenzene	ND	11.6	11.3	10.00	116	113	2.6
Toluene	ND	11.6	11.1	10.00	116	111	4.4
Benzene	ND	11.3	10.9	10.00	113	109	3.6
MTBE	ND	10.8	9.6	10.00	108	96	11.8
TPH (gas)	ND	57.6	58.7	100.00	58	59	1.8

$$\%\ \text{Recovery} = \frac{(MS - Sample)}{AmountSpiked} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 2 \cdot 100$$

RPD means Relative Percent Deviation

2995 / 20570

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HOUR ☐ 48 HOUR ☒ 5 DAY

Report To: Ron Scheele Bill To: Cambria Env. Tech
Company: Cambria Environmental Technology
6262 Hollis Street
Emeryville, CA 94608
Tele: (510) 450-1983 Fax: (510) 450-8295
Project #: 230-0116-124 Project Name: Begin
Project Location: 706 Harrison St. Oakland. Ca.
Sampler Signature: R. Scheele

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	METHOD PRESERVED HCl	METHOD PRESERVED HNO_3	METHOD PRESERVED Other
MW-1		2-1-02	9:40	4	voa	X					X			
MW-2		2-1-02	10:00	4	voa	X					X			
MW-3		2-1-02	9:20	4	voa	X					X			
MW-4		2-1-02	9:00	4	voa	X					X			
MW-5		2-1-02	8:40	4	voa	X					X			
MW-6		2-1-02	8:20	4	voa	X					X			
MW-7		2-1-02	8:05	4	voa	X					X			

ICE/t ✓
GOOD CONDITION ✓
HEAD SPACE ABSENT ✓
PRESERVATION APPROPRIATE ✓
CONTAINERS ✓
VOAS O&G METALS OTHER

Analysis Request	Other	Comments
BTEX & TPH as Gas (602/8020 + 8015)/MTBE		Confirm MTBE by 8260
TPH as Diesel (8015)		
Total Petroleum Oil & Grease (5520 E&F/B&F)		
Total Petroleum Hydrocarbons (418.1)		
EPA 601 / 8010		
BTEX ONLY (EPA 602 / 8020)		
EPA 608 / 8080		
EPA 608 / 8080 PCB's ONLY		
EPA 624 / 8240 / 8260		
EPA 625 / 8270		
PAH's / PNA's by EPA 625 / 8270 / 8310		
CAM-17 Metals		
LUFT 5 Metals		
Lead (7240/7421/239.2/6010)		
RCI		

(+) 89687
(+) 89688
(+) 89689
(+) 89690
(+) 89691
(+) 89692
(+) 89693

Relinquished By:	Date:	Time:	Received By:
R. Scheele	2/6	11AM	Scott Collins #283
Scott Collins / #283	2/6	1445	V. Miller 2/6/02 4:15
Relinquished By:	Date:	Time:	Received By:

Remarks: Report results in EDF format.

Sent By: McCampbell Analytical, Inc.; 1 925 798 4612; Sep-5-01 8:42AM; Page 2/2

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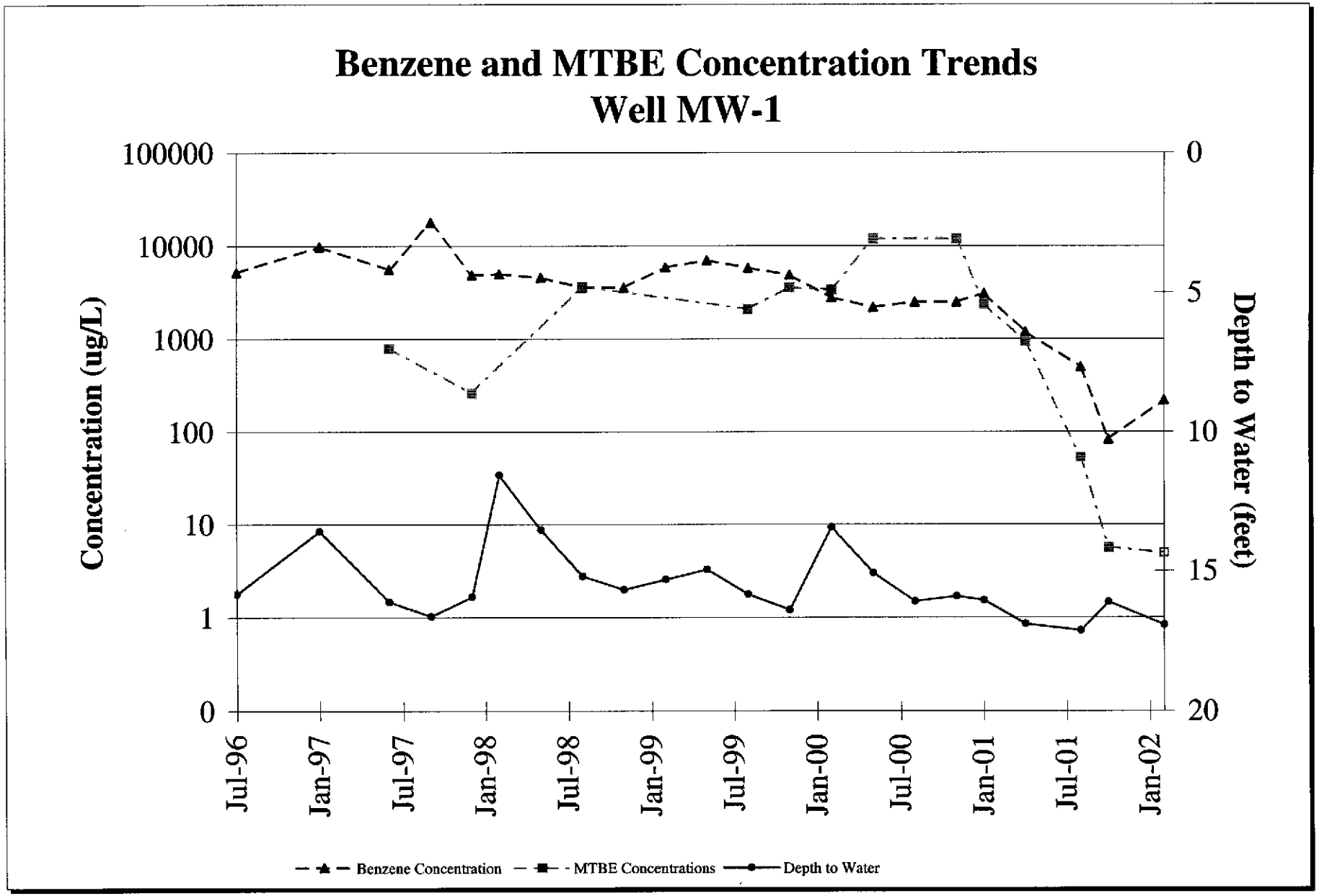
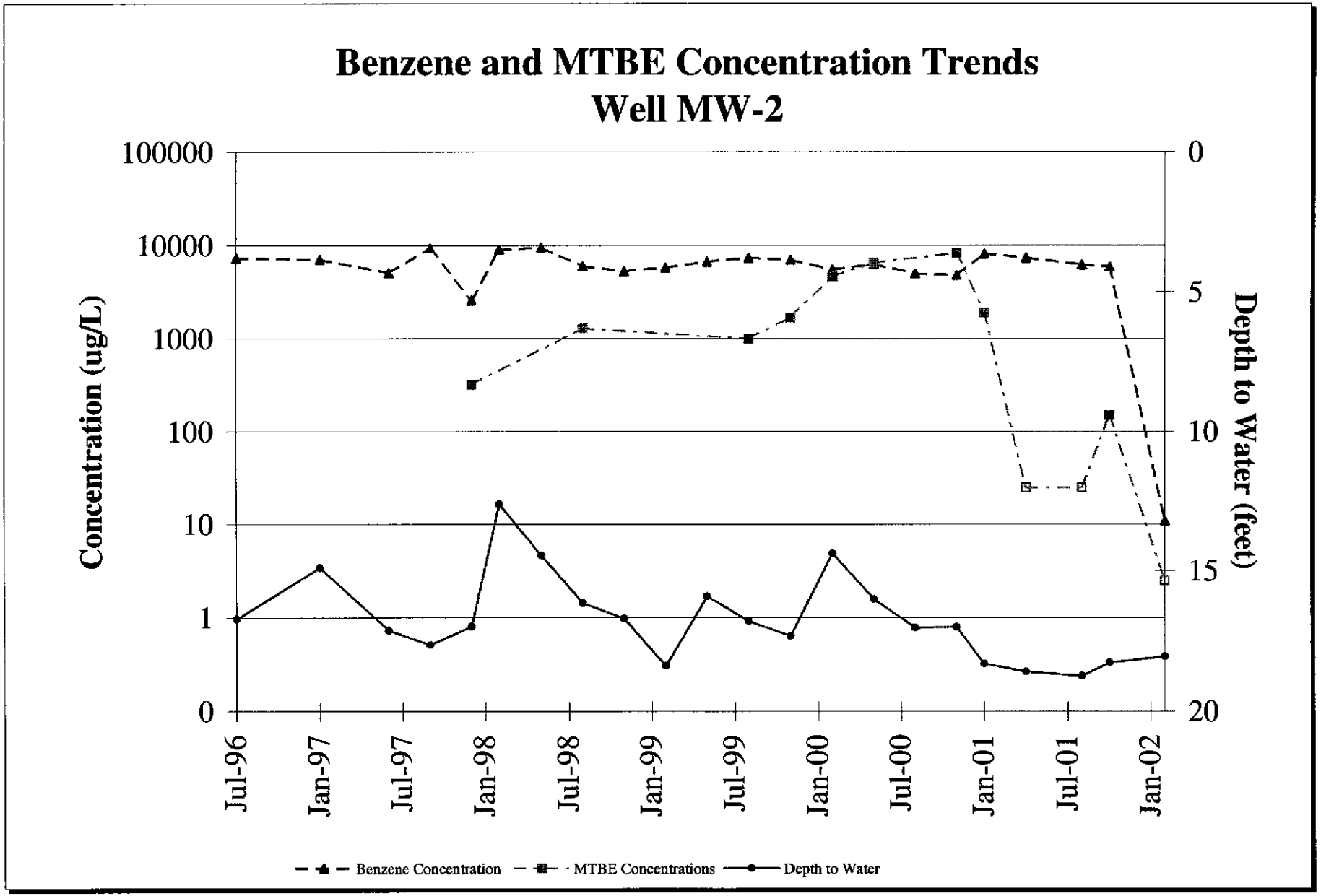
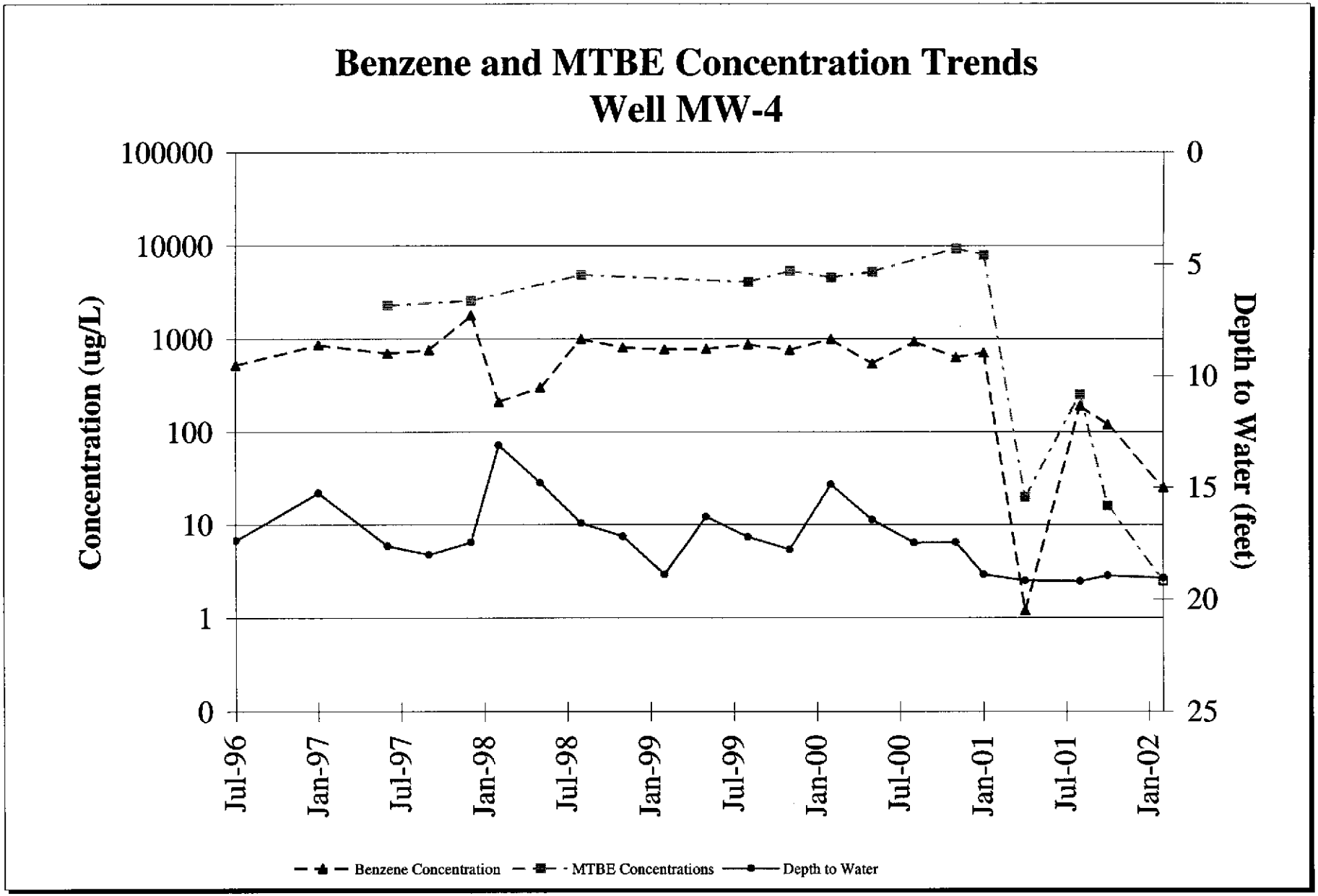
ATTACHMENT C

Benzene and MtBE Concentration Graphs


Benzene and MTBE Concentration Trends
Well MW-1
Concentration (ug/L)
100000
10000
1000
100
10
1
0
Depth to Water (feet)
0
5
10
15
20
Jul-96
Jan-97
Jul-97
Jan-98
Jul-98
Jan-99
Jul-99
Jan-00
Jul-00
Jan-01
Jul-01
Jan-02
Benzene Concentration
MTBE Concentrations
Depth to Water


Benzene and MTBE Concentration Trends
Well MW-2
Concentration (ug/L)
100000
10000
1000
100
10
1
0
Depth to Water (feet)
0
5
10
15
20
Jul-96
Jan-97
Jul-97
Jan-98
Jul-98
Jan-99
Jul-99
Jan-00
Jul-00
Jan-01
Jul-01
Jan-02
Benzene Concentration
MTBE Concentrations
Depth to Water


Benzene and MTBE Concentration Trends
Well MW-4
Concentration (ug/L)
100000
10000
1000
100
10
1
0
Depth to Water (feet)
0
5
10
15
20
25
Jul-96
Jan-97
Jul-97
Jan-98
Jul-98
Jan-99
Jul-99
Jan-00
Jul-00
Jan-01
Jul-01
Jan-02
Benzene Concentration
MTBE Concentrations
Depth to Water